Does Board Independence Affect Audit Fees?

Evidence from Recent Regulatory Reforms

ABSTRACT

To enhance board oversight, since 2002, US legislation has required listed companies to have a majority independent board. This paper uses this legislative change to examine the relation between board independence and audit fees. To provide a clean estimate of this relation, we adopt a difference-in-difference approach using a sample matched on client firm characteristics. We find that greater board independence is insignificantly associated with a change in audit fees when client firms operate in a weak information environment. When the information environment is strong, greater board independence is associated with an increase in audit fees. Our results are consistent with the nascent theory emphasising information asymmetry and provide insight into the effectiveness of the mandated board independence in relation to audit quality.

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1. Introduction

An increase in board independence was at the centre of the regulatory reform to improve corporate governance in the presence of widespread corporate and accounting scandals in the early 2000s. The US stock exchanges (NYSE and NASDAQ) issued new corporate governance rules in 2002 that were later approved by the US Securities and Exchange Commission (SEC).[1] These rules required all listed companies to have a majority of independent directors on their boards. The objective of this reform was to enhance board monitoring, particularly financial accounting monitoring, through greater representation of independent directors on corporate boards to protect shareholder interests (Duchin et al. 2010; Chen et al. 2015). However, the effectiveness of this significant legislative change remains much debated. Observers are sceptical about the effectiveness of increasing board independence, since the effectiveness of board independence can be affected by various factors, such as CEO bargaining power and directors' diligence. This study specifically focuses on the information factor, since independent directors' ability to monitor managers and control agency problems is often limited by their inferior information compared with corporate insiders (Fama and Jensen 1983; Jensen 1993; Duchin et al. 2010).

The theory of information acquisition costs (Raheja 2005; Harris and Raviv 2008; Duchin et al. 2010) argues that independent directors obtain greater knowledge of firm operations and risks and become more effective when the client firm operates in a strong

[1] See SEC press release 2002-23, February 13, 2002.

information environment and independent directors have easy access to firm information (or lower costs of acquiring such information). Better-informed independent directors, who are aware of firm risks, likely ask more questions and request greater effort from the auditor (hence higher fees). In a weak information environment, independent directors have difficulty in accessing relevant firm information to effectively perform monitoring duties through higher audit quality.

Empirically, we use a difference-in-difference approach for a sample matched on the characteristics of client firms with and without a majority independent board in the period prior to the legislative change (compliant and non-compliant firms, respectively, hereafter) to provide a clean estimate of the relation between board independence and audit fees.[2] Further, to provide insight into whether this relation varies for firms with a stronger information environment, we use an information index constructed from a firm's analyst coverage, analyst forecast error, and insider trading probability (PIN score) as the proxy of the richness of the firm's information environment.

Taking advantage of legislative reform requiring all listed firms to have an independent board, we mitigate the endogeneity problem that has plagued prior studies estimating the effect of board independence (Hermalin and Weisbach 2003; Duchin et al. 2010). After controlling endogeneity, we find that, on average, non-compliant firms do not experience an increase in audit fees after the regulatory change. Our result suggests that increasing board independence itself does not necessarily lead to higher audit quality.

[2] Since endogeneity is often caused by unobservable firm characteristics and omitted variables, there are advantages in using a difference-in-difference method with a sample matched on firm characteristics to mitigate these problems (Roberts and Whited 2013). However, there are limitations to what econometric methods can achieve. Our design, combined with the setting of a significant legislative change, can, to some degree, address the endogeneity embedded in prior research, but our design does not intend to offer a definitive treatment of the issue regarding the relation between board independence and audit fees and unobservable heterogeneity can still not be ruled out.

As indicated by the theory (e.g. Duchin et al. 2010; Chen et al. 2015), the effectiveness of independent directors can be affected by the richness of the firm's information environment. More importantly, we find that firms operating in a strong information environment experience an increase in audit fees after the mandatory change to independent boards. Our results are consistent with the theory emphasising that a richer information environment facilitates monitoring by independent directors (Harris and Raviv 2008; Duchin et al. 2010; Chen et al. 2015), and they indicate that independent boards are more effective in increasing audit fees[3] when the firm's information environment is strong.

This study makes two primary contributions to research and practice. First, we present initial evidence on how a firm's information environment affects the relation between board independence and audit fees. This is particularly important and relevant in the context of the recent financial crisis of 2007-08, in which regulators became concerned about board effectiveness and the dereliction of auditors' duties (House of Lords 2011). Second, we provide insight into the effects of a significant legislative change in board independence in relation to audit quality and how these effects may be conditioned on the client firm's information environment. Our results suggest that a firm's information environment must be considered when analysing the relation between corporate governance and audit.

The remainder of this paper proceeds as follows. Section 2 provides background information, reviews related research, and develops our hypotheses. Section 3 explains

[3] The economic magnitude of this increase is about $200,000, on average, which is due to 20 per cent (after unclogging) of the sample mean audit fees (about $1 million). This result is close to what is reported in the literature (i.e. Carcello et al. 2002).

the research design. Section 4 describes the sample and primary results. Section 5 reports further analyses and Section 6 concludes the paper.

2. Background, Related Research, and Hypotheses

Background and Related Research

In the aftermath of high-profile corporate and accounting scandals in the late 1990s and early 2000s, such as Enron and WorldCom, the SEC required major stock exchanges to consider ways of enhancing the corporate governance of listed companies. In response to this mandate, NYSE and NASDAQ adopted new rules in 2002 requiring all listed companies to have a majority independent board and a fully independent audit committee. These new rules later became part of the Sarbanes–Oxley Act (SOX) of 2002. These exchange rules and SOX, which embodies them, represent one of the most significant revisions of public company regulations in the United States since the Great Depression (Duchin et al. 2010). At its core, this legislative change seeks to improve the corporate governance and auditing of public companies (Coates 2007; Chhaochharia and Grinstein 2009).

A board is considered independent when the majority (more than 50%) of its directors are independent. A director is regarded as independent when that director does not have a material relationship with the company directly, nor is a partner, shareholder, or officer of a related company.[4] At the same time, audit committees of public companies are required to have a minimum of three members who must all be independent (fully

[4] Specifically, an independent director cannot be an employee or a family member of an executive officer of the company. An independent director cannot receive more than $120,000 in compensation from the company, other than director and committee fees (NYSE 303A.02).

independent audit committees).[5] All listed companies were required to comply with these new rules by the end of 2004. The same rules were adopted by SOX and approved by the SEC in 2003.[6]

Since board composition is endogenous, board independence and firm attributes could have spurious correlations. Hermalin and Weisbach (2003) illustrated this point by modelling the factors, such as high CEO bargaining power from excellent past performance, that have causal effects on both board structures and firm attributes. Similarly, Harris and Raviv (2008) argue that some factors can cause comovements in board composition and firm performance. In the context of audit, board independence and audit quality are likely to be endogenously determined, since firms with independent boards should have auditors that are more likely to detect and report accounting problems (Francis 2004). The regulatory reform requiring all corporate boards to be independent is an exogenous change in board composition, and this unique setting can be used to study the relation between board independence and firm attributes, such as audit fees and audit quality. Such studies are less likely to be subject to endogeneity.

Since the corporate scandals of the early 2000s, there has been renewed research interest in the effects of subsequent legislative changes on audit fees and audit quality (e.g. Audousset-Coulier 2015). Early research finds mixed evidence on the relation between board independence and audit fees. O'Sullivan (1999) finds no evidence that board characteristics influence auditors' pricing decisions. Carcello et al. (2002) report that audit fees are higher when the client firm has an independent board (but not an independent audit committee), suggesting greater audit effort in the presence of

[5] NYSE 303A.07. SOX, which became effective July 30, 2002, has similar requirements.
[6] See SEC press release 2002-23, February 13, 2002.

independent boards. Abbott et al. (2003) discovered that audit committee independence is also positively associated with audit fees. Despite the positive association found using data prior to the legislative change, the literature acknowledges endogeneity in the association between board composition and audit quality (Hermalin and Weisbach 2003; Francis 2004). Considering the nascent theory emphasising information asymmetry (Harris and Raviv 2008; Duchin et al. 2010; Chen et al. 2015), this study examines the relation between board independence and audit fees in the setting of a significant legislative change to mitigate endogeneity and how this relation is affected by the client firm's information environment.

Hypothesis Development: Relation between Board Independence and Audit Fess in the Context of the Regulatory Reform

From the perspective of agency theory, independent directors will demand higher-quality audits and more audit work (and hence higher audit fees paid by the client firm) than that which auditors normally provide, primarily to protect their own interests at the cost of the firm. These interests include protecting their own reputation and avoiding legal liability (Gilson 1990; Carcello et al. 2002; Abbott et al. 2003; Lee et al. 2004; Chen and Zhou 2007). Since monitoring by independent directors and their due diligence (as agents of shareholders) are often unobservable (Holmstrom 1979), increasing the quality of audit will also serve as one of the observable achievements of independent directors.

Specifically, compliant firms already had an independent board prior to the legislative change (pre-regulation period). Therefore the legislative change should not have affected them. Non-compliant firms, however, will have experienced a change from a non-independent board to an independent board after the legislative change (post-

regulation period). Under agency theory, non-compliant firms would experience an increase in audit fees in the post-regulation period. This discussion leads to our first hypothesis.

H1: *Non-compliant firms experience an increase in audit fees from the pre- to the post-regulation period*.

Two alternative theories provide tension against this hypothesis. Resource dependence theory and institutional theory argue that independent directors without adequate access to important resources, such as information, are not able to perform their duties effectively and can fulfil only ritualistic roles (Kosnik 1987; Nicholson and Kiel 2007; Cohen et al. 2008; Beasley et al. 2009; Chen et al. 2015). Such ceremonial boards will not be able to enhance oversight through higher audit quality.

Hypothesis Development: Effect of Information Environment on the Relation between Board Independence and Audit Fess

Moreover, a strong information environment will provide independent directors with easy access to relevant information about the firm (or will lower the costs of acquiring such information), which is the key to monitoring and control (Boone et al. 2007; Coles et al. 2007; Linck et al. 2008; Duchin et al. 2010). This easy access to firm information will help independent directors obtain better knowledge about the firm's operations and risks (Raheja 2005; Adams and Ferreira 2007; Harris and Raviv 2008). The increase in audit fees for firms with independent boards assumes that the newly added independent directors are effective in demanding higher levels of audit services (e.g. Carcello et al. 2002; Abbot 2003). Effectiveness in this context could mean that the independent

directors are well informed about areas requiring additional audit, such as areas of risk receiving insufficient attention or potential inadequacies in the existing audit program. Duchin et al. (2010), however, find that the effectiveness of adding outside directors to the board depends on the cost of acquiring information. That is, adding outsiders is expected to be effective only in a stronger information environment and where the cost of acquiring information is low.

Formally, the board, particularly the audit committee, reviews the overall audit scope (Blue Ribbon Committee 1999) and is sensitive to risks (Krishnan and Visvanathan 2009). Better-informed independent directors, who are aware of firm risks and potential inadequacies of the existing audit program, will likely ask more questions and request greater effort from the auditor. The auditor will be aware of this focus on risk and will carry out more work (hence higher fees). Since independent directors collaborate with management (CFOs) and often seeks ratification from shareholders in selecting the external auditor and setting the fees (Carcello et al. 2002; Dao et al. 2012), this greater knowledge of the firm will help the independent directors convince shareholders and management of the benefits of hiring better auditors, extending the audit scope, and paying more for the audit. Further, better firm knowledge increases the confidence and power of independent directors over management (CFOs) in fee negotiations through the audit committee, making higher expenditures on audit fees more likely (Finkelstein and Hambrick 1990; Zajac and Westphal 1996; Brown and Wright 2008; DeZoort et al. 2008).[7]

[7] Since audit fees are determined through fee negotiations, either a more powerful audit committee or more powerful management (CFOs) can exercise bargaining power on behalf of the organisation (Doty 2011; Hellman 2011). Despite the fact that SOX makes the audit committee directly responsible for determining

Informally, since the board is the client of the auditors, independent directors may signal the expectations placed on the audit firm (Carcello et al. 2002). With easier access to firm information, independent directors will be less likely to become ritualistic figureheads and more likely to become effective in monitoring management (Duchin et al. 2010). When effective independent directors signal to auditors that the expectations placed on the audit firm are very high, auditors will understand that independent directors are the real monitors of management and are demanding high audit quality (Cohen et al. 2010). Thus, the auditors will perform a high-quality audit to meet the expectations of the client, that is, the board.

By contrast, independent directors are likely to be ineffective or ceremonial when the firm operates in a weak information environment and the costs of acquiring firm information are high (Boone et al. 2007; Coles et al. 2007; Nicholson and Kiel 2007; Cohen et al. 2008; Linck et al. 2008; Beasley et al. 2009; Duchin et al. 2010). With an uninformed or ceremonial independent board, independent directors are unfamiliar with firm operations and risks. Management (CFOs) will lead the communications and fee negotiations with auditors and sometimes become gatekeepers of auditor access to the audit committee (Crosley 2005; Knechel 2007; Hellman 2011), making it more difficult for independent directors to request more audit effort and greater spending on audit.

To summarise, given the argument of information acquisition costs, a strong information environment can provide easy access to firm information, and better-informed independent directors will be more aware of firm risks and may request more

auditor compensation, management (CFOs) still exerts significant influence in fee negotiations (Cohen et al. 2010).

audit work, leading to higher audit fees for non-compliant firms. We state our second hypothesis (in alternative form) as follows.

H2: *Non-compliant firms with a stronger information environment experience an increase in audit fees compared with non-compliant firms with a weaker information environment from the pre- to the post-regulation period.*

Alternatively, auditors take corporate governance structures into consideration when planning an audit. Strong corporate governance reduces auditor assessment of internal control risk and causes the auditor to reduce the extent of audit procedures, thus lowering audit fees (Cohen and Hanno 2000). Independent directors are effective in monitoring and control in a strong information environment (Duchin et al. 2010). Therefore, auditors are likely to reduce the internal control risk assessment of a firm with an independent board in a strong information environment (hence lower fees).

In a weak information environment, auditors will not reduce the internal control risk assessment, since the independent directors will not be effective at strengthening corporate governance. Meanwhile, the independent directors may want to strengthen audits in a weak information environment, since they may feel insecure because of reputation and litigation concerns (hence higher fees). The effectiveness of this would depend on the quality of information they have about the firm to properly assess risk areas in the firm. One can expect this to be lacking in a weak information environment.

Under the alternative argument, a change to an independent board in a strong information environment is likely to reduce auditor assessment of control risk, leading to lower audit fees for non-compliant firms. Thus, in a strong information environment,

whether a change to an independent board increases audit fees remains an empirical question.

3. Research Design

To test the hypotheses, we adopt a two-stage design. In the first stage, we use propensity scores to produce a sample matched on firm characteristics for compliant and non-compliant firms. Using this matched sample, we adopt a difference-in-difference approach in the second stage to examine whether there is an incremental change in audit fees for non-compliant firms after the legislative change.

Propensity Score Matching

We use the propensity score matching model to match firms on a range of characteristics related to whether a firm has a majority independent board in the pre-regulation period.[8] We use a logit model to estimate the probability of not having a majority independent board in the pre-regulation year of 2000, and save the estimated probability (the propensity score). The logit model is specified as follows:

$$NC = \alpha_0 + \alpha_1 SIZE + \alpha_2 LEV + \alpha_3 AGE + \alpha_4 SEG + \alpha_5 RND + \alpha_6 STD + \alpha_7 BTM + \alpha_8 SP + \alpha_9 CEOOwn + \alpha_{10} MGOwn + \alpha_{11} DUO + IndustryControls + \varepsilon_{it} \quad (1)$$

where

NC = indicator for non-compliant firms, equal to 1 if a firm did not have a majority independent board in 2000, and 0 otherwise;
SIZE = natural log of total assets (in millions);
LEV = leverage, measured as total long-term debt over total assets;
AGE = natural log of firm age; firm age is the number of years the firm appears in

[8] Propensity score matching is considered superior to the Heckman (1979) selection models, since it provides a more direct estimate of the treatment effects. Propensity score matching is an appropriate design choice for our study, since the attribute-based matching will naturally phase out the effects of observable differences in compliant and non-compliant firms' characteristics on their audit fees. Using a logit model is the most common method to estimate propensity scores (Guo and Fraser 2010).

COMPUSTAT;

SEG = natural log of the number of business segments which a firm has in the year;

RND = annual R&D expenditures over annual sales;

STD = return volatility, measured as the standard deviation of a firm's stock returns over the preceding 24 months.

BTM = book to market ratio, measured as total assets over the sum of total liabilities and market value of equity;

SP = natural log of closing market price per share of the firm in the year;

CEOOwn = number of shares held by the CEO divided by total number of shares outstanding;

MGOwn = number of shares held by directors divided by total number of shares outstanding;

DUO = indicator equal to 1 if a firm's CEO is also its Chairman in the year, and 0 otherwise.

We regress the non-compliance indicator (*NC*) on a set of firm characteristics plus industry-fixed effects (*IndustryControls*). Since there is no exclusion requirement on what variables should be included in the propensity score matching model, we include a comprehensive set of variables identified in prior research on whether a firm has a majority independent board (Duchin et al. 2010; Armstrong et al. 2014).[9] We also add managerial ownership variables and CEO–chair duality, as *CEOOwn*, *MGOwn*, and *DUO*, since prior research shows that managerial ownership-related variables are associated with board structure (Linck et al. 2008). We then match, without replacement, each non-compliant firm with the compliant firm that has the closest predicted value from the logit model within a maximum distance of 2 per cent. Through the matching process, the resulting differences in the increase in audit fees between compliant and non-compliant firms can be better attributed to the treatment effect rather than existing firm characteristics.

[9] We include the natural log of the closing share price (SP) to control for market valuation and stock liquidity of the firm (Utama and Cready 1997; Chordia et al. 2006), which is thought to be relevant to the model of board independence (Armstrong et al. 2014).

Difference-in-Difference Method

The difference-in-difference method is used to provide an estimate of the effects of legislative changes (e.g. Duchin et al. 2010; Chan et al. 2012). Note, however, that for clean inferences treatment should be assigned randomly over firms, which is not the case in our setting. Specifically, we regress the change in audit fees from the pre-regulation period (2000–2001) to the post-regulation period (2004–2005) on the non-compliance indicator and control for variables for the propensity score–matched sample estimated by Equation (1).[10] To ensure that the result is not driven by a particular year, we average the variables in the pre-regulation period (2000–2001) and the post-regulation period (2004–2005) before calculating the change from the pre- to the post-regulation period. The model is specified as follows:

$$\Delta AFEE = \beta_0 + \beta_1 NC + \beta_2 NC \times HIX + \beta_3 \Delta SIZE + \beta_4 \Delta LEV + \beta_5 \Delta ROA + \beta_6 \Delta LIQD + \beta_7 \Delta SEG + \beta_8 \Delta LOSS + IndustryControls + \varepsilon \qquad (2)$$

where

$\Delta AFEE$ = $\ln(AFEE_{2004,2005}) - \ln(AFEE_{2000,2001})$; *AFEE* is audit fees (in thousands);

NC = indicator for non-compliant firms, equal to 1 if a firm did not have a majority independent board in 2000, and 0 otherwise;

HIX = indicator equal to 1 if *IX* is above sample median, and 0 otherwise; *IX* is equal to (*HAC*+*HAE*+*PIN*)/3; *HAC* is an indicator equal to 1 if a firm's analyst coverage (the number of unique analysts) is above the sample median, and 0 otherwise; *HAE* is an indicator equal to 1 if a firm's earnings forecast error is below the sample median, and 0 otherwise; *PIN* is an indicator equal to 1 if a firm's probability of insider trading is below the sample median, and 0 otherwise;

$\Delta SIZE$ = *%* change in *SIZE*; *SIZE* is natural log of total assets (in millions);

ΔLEV = change in *LEV*; *LEV* is leverage, measured as total long-term debt over total assets;

ΔROA = change in *ROA*; *ROA* is return on assets, measured as income before

[10] As stated above, the new rule of majority independent boards was introduced by stock exchanges (NYSE and NASDAQ) in 2002 and firms were required to comply with it by no later than the end of 2004 (i.e. 2002 and 2003 are transitional years). Therefore, 2000 is selected as the pre-regulation benchmark year and 2005 as the post-regulation benchmark year.

extraordinary items over total assets;

$\Delta LIQD$ = change in *LIQD*; *LIQD* is current assets over current liabilities;

ΔSEG = *%* change in *SEG*; *SEG* is natural log of the number of business segments which a firm has in the year;

$\Delta LOSS$ = change in *LOSS*; *LOSS* is indicator equal to 1 if a firm has negative net income in the year, and 0 otherwise;

The variable *NC* is an indicator for non-compliant firms. Firms are classified as non-compliant if they did not have a majority independent board in 2000. Providing evidence for H1, the coefficient of *NC* captures the incremental change in audit fees attributed to non-compliant firms. To provide evidence for H2, *NC* is then interacted with the proxy for the information environment. Since no single metric exists that can capture all the richness of the information environment, we construct a comprehensive measure of the information environment (*HIX*)[11], based on the firm's analyst coverage, analyst forecast error, and the probability of insider trading. The coefficient of the interaction term of *NC* with *HIX* captures the incremental change in audit fees for firms with lower information acquisition costs.

We include a range of control variables identified in prior research as being related to audit fees (Simunic 1980; Palmrose 1986; Hackenbrack and Knechel 1997; Krishnan 2003; Goodwin-Stewart and Kent 2006; Hogan and Wilkins 2008). Specifically, we include the natural log of total assets (*SIZE*), leverage (*LEV*), return on assets (*ROA*), current ratio (*LIQD*), number of business segments (*SEG*), and indicators for negative income (*LOSS*). Equation (2) includes industry-fixed effects (*IndustryControls*) to account for variation across industries.

[11] Around this time period, there was a general improvement in the information environment due to the introduction of SOX and related regulatory changes. To address potential endogeneity between board independence and information environment, we measure *HIX* in 2000 (i.e. in the pre-regulation period) to make sure that *HIX* is not confounded by the change in board independence from the pre- to the post-regulation period (Duchin et al. 2010; Chen et al. 2015).

4. Empirical Results

Sample and Descriptive Statistics

We start with the 1,755 firms for which there is information on independent directors available in Risk Metrics (formerly IRRC). The Director Legacy file in Risk Metrics contains information about a firm's directors, such as whether the director is independent and whether the director is also a member of the firm's audit committee. We collect data on audit fees, going concern opinions, and financial statement restatements from Audit Analytics; data on firm stock returns are from the Center for Research in Security Prices (CRSP); and data on firm analyst following and analyst forecast error are from I/B/E/S. We obtain firm probabilities of insider trading (PIN score) from Stephen Brown's website.[12] The remainder of the data, related to Big 4 auditors, change in auditors, number of business segments, and firm financials, were obtained from Compustat. We merge the initial Risk Metrics sample with all the other data sources to carry out the matching process based on Equation (1). After matching compliant firms with non-compliant firms, we obtain a sample of 602 firms (301 compliant firms and 301 non-compliant firms) for the tests.

Figure 1 shows change in board and audit committee independence over time from 2000 to 2005 for the sample. As shown in Figure 1, the average percentage of independent directors on boards experiences a steady increase over time. Board independence increases from 55 per cent in 2000 to nearly 70 per cent in 2005. Audit committee independence increases from 80 per cent to 95 per cent during the same period. Figure 2 shows change in audit fees separately for compliant and non-compliant

[12] See http://www.rhsmith.umd.edu/faculty/sbrown.

firms. For all sample firms, average audit fees increase significantly from 2000 to 2005. Compared with compliant firms, non-compliant firms experience a greater increase in audit fees, on average.

Table 1, Panel A, displays the descriptive statistics separately for compliant and non-compliant firms after the matching process based on Equation (1). The matching process is effective, since the means of the variables used in the main and additional tests are insignificantly different between compliant and non-compliant firms. Although the samples are constructed differently, the mean analyst coverage of a firm is similar to that reported by Chen et al. (2015). More importantly, the first row of Panel A shows that the mean change in audit fees ($\Delta AFEE$) is insignificantly different between compliant and non-compliant firms (p = 0.44). This result shows that once firm characteristics are matched, there is no significant difference between compliant and non-compliant firms in the change in audit fees from the pre- to the post-regulation period.

Table 1, Panel B demonstrates the sample yearly mean distributions of board independence, board size, and audit fees. Mean board size (nine directors on board) remains constant over the sample period for both compliant and non-compliant firms. As would be expected, the mean board independence of the compliant firms is above 50 per cent throughout the sample period. In contrast, non-compliant firms had less than 50 per cent independent directors on their boards prior to 2002. In 2002, after the legislative change, we observe an increase in board independence to 50 per cent for these firms. After 2002, we observe a steady increase in the board independence of non-compliant firms. Although the samples are constructed differently, the distributions of board independence are comparable to those reported by Chen et al. (2015). The difference in

the distributions of board independence between compliant and non-compliant firms supports the use of a difference-in-difference method with a matched sample. Panel B also reports the mean distributions of audit fees for the period 2000 to 2005. There is a clear increase in audit fees over time, consistent with the proposition that audit fees have been increasing over recent years (DeFond and Francis 2005).

Table 1, Panel C presents a two-by-two matrix of change in audit fees ($\Delta AFEE$) conditioned on information environment separately for compliant and non-compliant firms. Consistent with H2, the increase in audit fees for non-compliant firms with a strong information environment ($HIX = 1$) is larger than for compliant firms and non-compliant firms with a weak information environment ($HIX = 0$). Table 1, Panel D, presents the mean values of the main variables in levels for years 2000 and 2005 separately for compliant and non-compliant firms. As shown in Panel D, the sample firms (both compliant and non-compliant firms) experience an increase in audit fees from 2000 to 2005.

Table 2 reports the correlations of the variables used in the primary test. As shown, there are no significant correlations between the non-compliance indicator and the change in audit fees. The relation between independent boards and audit fees needs further investigation in the multivariate tests. The absolute values of the correlations between the variables are mostly under 0.30, suggesting that multicollinearity is not a concern.

Primary Results

Table 3 reports the regression results of Equation (2). To investigate the relation between board independence and audit fees, in Column (1) of Table 3 we report the result of regressing the change in audit fees ($\Delta AFEE$) on the non-compliance indicator (NC). The

coefficient of the non-compliance indicator (*NC*) is insignificant, indicating that there is no incremental change in audit fees for non-compliant firms after the legislative change, on average. The signs of the coefficients of the significant controls are consistent with expectations. The coefficients of Δ*SIZE* and Δ*LEV* are significantly positive, suggesting that larger and riskier clients incur higher audit fees. The coefficient of Δ*LIQD* is significantly negative, suggesting that clients with greater liquidity have lower risks and incur lower audit fees.

To investigate the effect of the information environment on the relation between board independence and audit fees, in Column (2) of Table 3 we report the result of interacting the non-compliance indicator (*NC*) with the measure of information environment (*HIX*).[13] The adjusted R^2 (20 per cent) value for the regression results with the interaction term of *NC* with *HIX* is marginally higher than the R^2 (19 per cent) value for those results without the interaction term, suggesting greater explanatory power for the model including the proxy for the information environment. The coefficient of the non-compliance indicator (*NC*) is insignificant, indicating that board independence for non-compliant firms in a weak information environment is not significantly associated with change in audit fees. The coefficient of the interaction term (*NC*×*HIX*) is significantly positive, suggesting that greater board independence increases audit fees in a strong information environment. Moreover, the sum of coefficients on *NC* and *NC*×*HIX* (β_1 and β_2) is significantly different from zero (t = 1.99), indicating an overall increase in

[13] In the untabulated results, we also include *HIX* besides the interaction of *NC* in the regression. The results are qualitatively similar to those reported in the paper. The coefficient on *HIX* is negative, suggesting firms with a stronger information environment before the regulatory change experience a smaller increase in audit fees after the regulatory change. Since there is a general improvement in information environment with the regulatory changes (such as SOX and the new listing rules) around this time period, this result is consistent with the assumption that the relation between information environment and audit fees is positive.

audit fees for non-compliant firms with a strong information environment after the legislative change.

To summarise, after controlling for firm characteristics and using a difference-in-difference method, we find that board independence is insignificantly associated with change in audit fees when client firms operate in a weak information environment. When the information environment is strong, greater board independence increases audit fees. Non-compliant firms with a stronger information environment experience an overall increase in audit fees compared with those with a weaker information environment after the regulatory change. These findings are consistent with H2.

5. Further Analyses

To further investigate the relation between board independence and audit fees, we conduct a series of additional analyses. First, we carry out further analysis of independent audit committees, because audit committee independence is an integral part of the regulatory reform of board independence. Audit committee members are more directly involved in communicating with auditors and determining the audit process of the company than are other board members. Second, firms identified as accelerated filers (large companies) are subject to more stringent internal control regulations under SOX. Directors of accelerated filers are held legally responsible for attesting to the effectiveness of the company's internal controls and should be more concerned with audit quality. Therefore, we test how the main results persist in accelerated filers. Third, we further narrow down the definition of non-compliant firms to include only non-compliant firms that were known to have switched to an independent board in 2005, to determine whether the main results persist after using a stricter definition of non-compliant firms.

Fourth, we repeat our tests using a methodology consistent with that used by Duchin et al. (2010) to determine whether our results are robust to these authors' instrumental variable approach. Finally, we conduct additional tests using alternative measurements of information environment proxy, performing internal validity checks of the difference-in-difference design and adding additional controls to the tests.

Independent Audit Committees, Information Environment, and Audit Fees

Table 4 reports the regression results of the relation between independent audit committees and audit fees. After the legislative change, all listed companies were required to have a fully independent audit committee. Since the audit committee of the board is responsible for overseeing the firm's accounting and auditing, it is important to investigate whether the primary results persist in independent audit committees.

To examine the effects of audit committee independence on audit fees, we regress changes in audit fees from the pre-regulation to the post-regulation period ($\Delta AFEE$) on the non-compliance indicator of fully independent audit committees (*NCA*). The variable *NCA* is an indicator equal to 1 if the firm did not have a fully (100 per cent) independent audit committee in 2000, and zero otherwise; *NCA* captures the effects of change in audit committee independence on change in audit fees. To further investigate the effects of information environment on the relation between independent audit committees and audit fees, we interact the non-compliance indicator of fully independent audit committees (*NCA*) with the proxy of the information environment (*HIX*). The coefficient of the interaction term captures the effects of the information environment on the relation between independent audit committees and change in audit fees.

Column (1) of Table 4 reports the results without interacting with information acquisition costs. As shown, *NCA* is insignificantly associated with change in audit fees, suggesting that independent audit committees are not associated with higher audit fees, on average. Column (2) reports the results of *NCA* interacting with the proxy of the information environment (*HIX*). The coefficient of the non-compliance indicator (*NCA*) is insignificant, indicating that audit committee independence for non-compliant firms in a weak information environment is not significantly associated with changes in audit fees. The coefficient of the interaction term of *NCA* with *HIX* is significantly positive, suggesting that greater audit committee independence increases audit fees in a strong information environment. The sum of the coefficients of *NCA* and the interaction term is also significantly positive ($t = 2.25$), suggesting that firms switching to fully independent audit committees experience an increase in audit fees when the firm's information environment is strong. The results shown in Table 4 are consistent with the primary results reported in Table 3.

Board Independence, Information Environment, and Change in Audit Fees: Accelerated Filers

Accelerated filers are subject to more intense regulatory oversight than non-accelerated filers. Section 36 of the Federal Deposit Insurance Act and Part 63 of the Federal Deposit Insurance Corporation (FDIC) regulations mandate internal control requirements over financial reporting and require auditors to attest to the effectiveness of the internal control system for banks with total assets over $500 million (increased to $1 billion in 2005). These rules were later adopted in Section 404 of SOX (SOX 404). Companies subject to

these rigorous internal control regulations are identified as accelerated filers in their regulatory filings.

Since accelerated filers are subject to more intense regulatory scrutiny, the independent directors of non-compliant accelerated filers should require a higher quality of assurance after the legislative change to meet the regulatory requirements than their compliant counterparts. Therefore, we test whether the primary result (i.e. an independent board is effective in increasing audit fees when the firm's information environment is stronger) persists in accelerated filers.

The results presented in Table 5 are consistent with the primary results. The interaction term between *NC* and *HIX* is significant at the 1 per cent level, suggesting greater board independence mitigates the decrease in audit fees for accelerated filers in a strong information environment. The sum of the coefficients of *NC* and the interaction term is also significantly positive, with $t = 1.92$ in Column (2), suggesting that non-compliant accelerated filers operating in a strong information environment pay higher audit fees than do non-compliant accelerated filers operating in a weak information environment.

Stricter Definition of Non-Compliant Firms

To test whether the primary results are robust to an alternative definition of non-compliant firms, we narrow the definition of non-compliant firms to include those that were known to have switched from a non-independent board in 2000 to an independent board in 2005. The results of using this stricter definition of non-compliant firms are reported in Table 6.

As reported in Column (1) of Table 6, the coefficient of the non-compliance indicator under the stricter definition (*NC05*) remains insignificant. Column (2) reports the results of interacting the proxy for the information environment (*HIX*) with *NC05*. The coefficient of the interaction term is significantly positive, suggesting that greater board independence increases audit fees in a strong information environment. The primary results persist after using a stricter definition of non-compliant firms.

Methodology of Duchin et al. (2010)

We also replicate the tests using a methodology consistent with Duchin et al. (2010). Following these authors, we estimate a first-stage regression that identifies exogenous changes in board composition from 2000 to 2005 based on compliance with board regulations in SOX in 2000; we then use fitted changes in board composition from the first-stage regression to explain changes in audit fees from 2000 to 2005 in the second-stage regressions.

The results are reported in Table 7. Column (1) reports the first-stage regression that predicts the change in the percentage of independent directors on the board. The non-compliance indicator (*NC*) is highly significant at the 1 per cent level, indicating *NC* is a strong predictor of change in board independence from 2000 to 2005. The column with $\Delta AFEE$ as the dependent variable reports the main results. The coefficients of $\Delta Indep.Directors$ predicted by the first-stage regression are insignificant, suggesting board independence is not associated with changes in audit fees for client firms operating in a weak information environment. The coefficient of the interaction term with *HIX* is highly significant and positive at the 1 per cent level. These results suggest that non-compliant firms operating in a strong information environment experienced a significant

increase in audit fees after the legislative change. The results estimated using the method of Duchin et al. (2010) are consistent with our primary results.

Additional Tests

Additionally, we examine whether the results are sensitive to alternative measurements of the information environment proxy. First, we use an indicator variable for high analyst coverage of the firm as a measure of the richness of the firm's information environment. Second, similar to Chen et al. (2015), we construct a continuous measure of the information environment proxy based on the average of quintile ranks of analyst coverage, forecast error, and PIN scores (reverse ranks for forecast error and PIN scores). The quintile ranks are denoted as 0, 0.25, 0.5, 0.75, and 1, hence the continuous measure of information environment has a range of [0, 1]. A higher value of this information environment proxy implies a more transparent information environment and a lower information acquisition cost. The results using these alternative specifications of the information environment proxy remain similar to the primary results.

As highlighted in Roberts and Whited (2013), we perform additional robustness tests to provide further assurance to the difference-in-difference design, identifying a causal effect. Specifically, we conduct a placebo test by artificially selecting a pseudo-event year of 2005. Since the regulatory change actually happened in 2002 and should have been completed by 2005, we predict that there should not be a significant difference in the change in audit fees between compliant and non-compliant firms around 2005. Consistent with our prediction, no significant result is found using the artificial event year of 2005. We also conduct a falsification test by changing the dependent variable to the change of whether the client firm has foreign currency translation income. Since foreign

currency translation income is dependent on the exchange rate rather than board structure, we predict that there should not be significant difference in this dependent variable between compliant and non-compliant firms. Consistent with our prediction, we find no significant results in this test. In summary, the above results suggest that the identified positive effect of board independence on audit fees in a strong information environment, using the exogenous variation generated by regulatory reform on board independence, is unlikely to be driven by chance or by other unobservable shocks. Therefore, the effect of board independence on audit fees in a strong information environment appears causal.

We also add controls to all the tests conducted. These additional controls include indicators for foreign income, restructuring, new auditors, Big 4 auditor, restatements of financial reports and going concern audit opinions. They also include managerial ownership, volatility of client firm daily stock returns, annual stock returns, and litigation risk. The main results are not sensitive to the addition of these controls.

6. Conclusion

Using a significant US legislative change and the difference-in-difference approach for a propensity score-matched sample, we examine the relation between board independence and audit fees under the effects of firm information environment. We find that greater board independence is insignificantly associated with changes in audit fees when client firms operate in a weak information environment. When the information environment is strong, non-compliant firms experience an increase in audit fees after the legislative change on board independence. Our results persist when we replace independent boards with independent audit committees, limit the sample to include only accelerated filers, narrow the definition of non-compliant firms, and use the method of Duchin et al. (2010).

Our findings are consistent with the nascent theory emphasising the importance of the information environment to the effective monitoring of independent boards.

Our results hold several implications. First, they inform policy makers that independent boards are effective in increasing audit quality, as measured by audit fees, only when the firm operates in a strong information environment. This suggests that the requirement of a fully independent board may not be effective for firms operating in a weak information environment. Second, as the debate continues on whether the 'one size fits all' legislation of board independence in SOX is effective, our findings of increased audit fees relating to the independent boards of firms with a strong information environment generate evidence on whether regulatory requirements should differentiate between firms with different information environments. Finally, our findings are timely and relevant, given the concerns of legislators about board effectiveness and the dereliction of auditors' duties in the recent financial crisis of 2007-08. In particular, our results indicate that a firm's information environment needs to be considered for increased board independence to be effective in enhancing audit quality and preventing future corporate scandals.

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Appendix. Variable Definitions

$\Delta AFEE$	=	$\ln(AFEE_{2004,2005}) - \ln(AFEE_{2000,2001})$; *AFEE* is the natural log of audit fees (in thousands);
AGE	=	natural log of firm age; firm age is the number of years from when the firm first appears in COMPUSTAT;
BTM	=	book to market ratio, measured as total assets over the sum of total liabilities and the market value of equity;
CEOOwn	=	number of shares held by the CEO divided by total number of shares outstanding;
DUO	=	indicator equal to 1 if a firm's CEO is also its chairman in the year, and 0 otherwise;
HIX	=	indicator equal to 1 if *IX* is above sample median, and 0 otherwise; *IX* is equal to (*HAC*+*HAE*+*PIN*)/3; *HAC* is an indicator equal to 1 if a firm's analyst coverage (number of unique analysts) is above the sample median, and 0 otherwise; *HAE* is an indicator equal to 1 if a firm's earnings forecast error is below the sample median, and 0 otherwise; *PIN* is an indicator equal to 1 if a firm's probability of insider trading is below the sample median, and 0 otherwise;
FE	=	forecast error, measured as the absolute value of the difference between actual earnings per share and the consensus analyst forecast before earnings announcements, scaled by stock price at the beginning of the year;
ΔLEV	=	change in *LEV*; *LEV* is leverage, measured as total long-term debt over total assets;
$\Delta LIQD$	=	change in *LIQD*; *LIQD* is current assets over current liabilities;
$\Delta LOSS$	=	change in *LOSS*; *LOSS* is an indicator equal to 1 if a firm has negative net income in the year, and 0 otherwise;
MGOwn	=	number of shares held by directors divided by total number of shares outstanding;
NC	=	indicator for non-compliant firms, equal to 1 if a firm did not have a majority independent board in 2000, and 0 otherwise;
NC05	=	indicator for non-compliant firms, equal to 1 if a firm did not have a majority independent board in 2000 and in 2005, and 0 otherwise;
NCA	=	indicator equal to 1 if the firm did not have a fully (100 per cent) independent audit committee in 2000, and 0 otherwise;
PIN	=	probability of insider trading (PIN score);
RND	=	annual R&D expenditures over annual sales;
ΔROA	=	change in *ROA*; *ROA* is return on assets, measured as income before extraordinary items over total assets;
ΔSEG	=	% change in *SEG*; *SEG* is the natural log of the number of business segments which a firm has in the year;
$\Delta SIZE$	=	% change in *SIZE*; *SIZE* is the natural log of total assets (in millions);
SP	=	natural log of closing market price per share of the firm in the year;
STD	=	return volatility, measured as the standard deviation of a firm's daily stock returns over the preceding 24 months;

Figure 1. Change in Board and Audit Committee Independence over Time

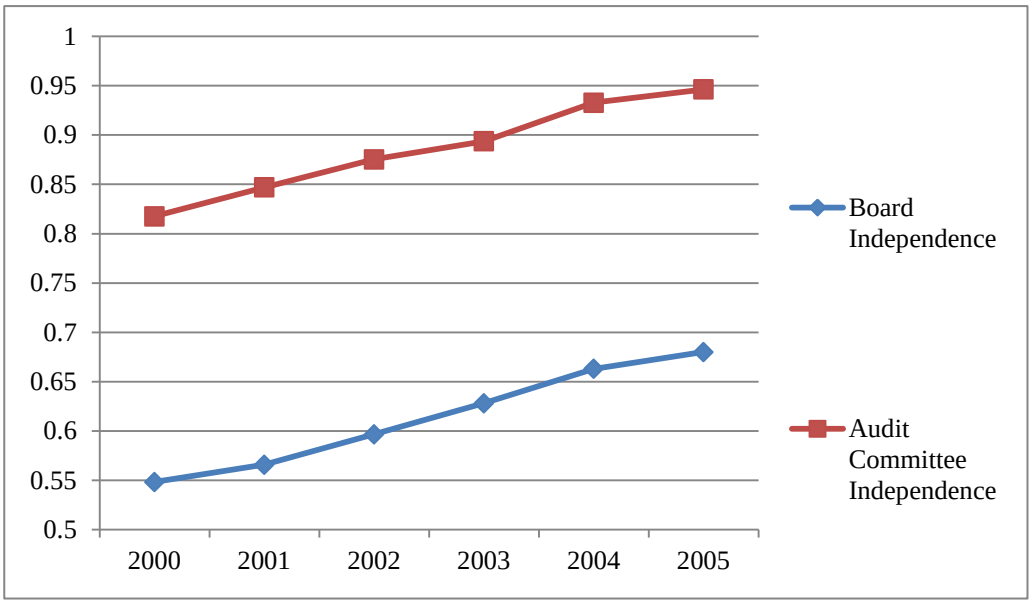

Figure 1 shows the change in board and audit committee independence (mean % of independent directors on board or audit committee) from 2000 to 2005 for the sample.

Figure 2. Change in Audit Fees for Compliant and Non-compliant Firms over Time

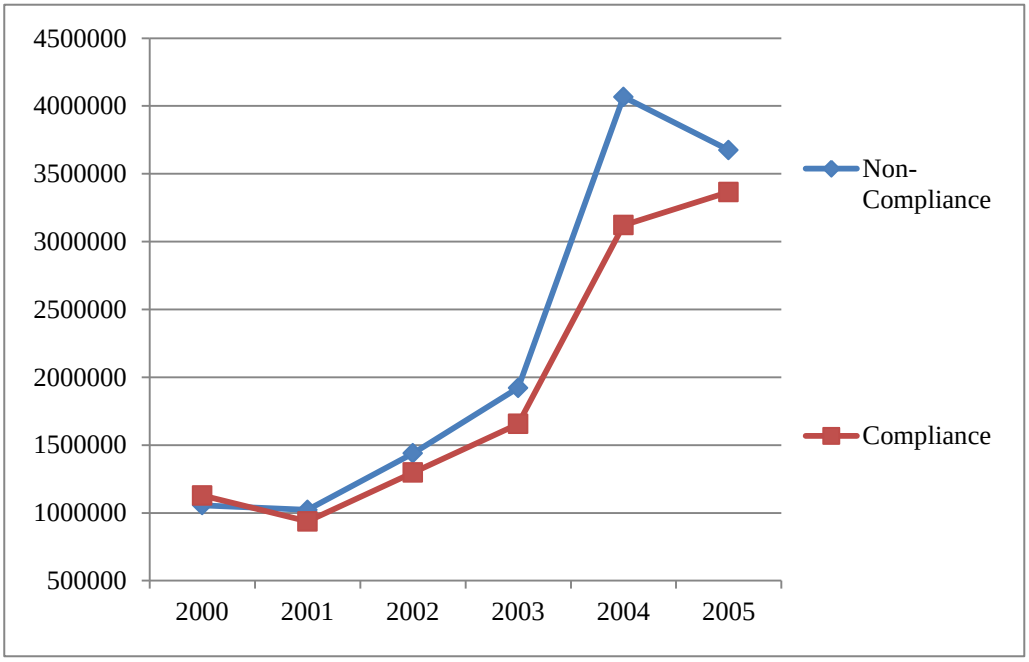

Figure 2 shows the change in mean audit fees in dollar amounts from 2000 to 2005 for compliant and non-compliant firms of the sample.

Table 1. Descriptive Statistics

Panel A: Differences in variables between compliant and non-compliant firms

	Compliant Firms		Non-compliant Firms		*t*-test
	Mean	Std.	Mean	Std.	*p*-value
Δ*AFEE*	0.213	0.108	0.206	0.102	0.44
Δ*SIZE*	0.041	0.074	0.034	0.082	0.23
Δ*LEV*	-0.009	0.161	0.001	0.253	0.52
Δ*ROA*	0.029	0.285	0.020	0.183	0.67
Δ*LIQD*	-0.198	1.796	-0.382	3.036	0.36
Δ*SEG*	-0.051	0.286	-0.056	0.284	0.85
Δ*LOSS*	-0.033	0.438	-0.096	0.440	0.07
#ANALYST	9.963	9.350	9.883	9.527	0.91
FE	0.290	1.639	0.407	3.276	0.58
PIN	0.137	0.072	0.143	0.077	0.35

Panel B: Change in board independence and audit fees over time

	Compliant Firms			Non-compliant Firms		
Year	Board Independence	Board Size	Audit Fees ($)	Board Independence	Board Size	Audit Fees ($)
2000	70.06%	9	1,127,872	38.67%	9	1,056,128
2001	69.11%	9	937,063	43.90%	9	1,021,411
2002	69.19%	9	1,296,894	48.36%	9	1,438,218
2003	70.39%	9	1,655,602	54.00%	9	1,921,629
2004	72.17%	9	3,121,528	59.38%	9	4,066,673
2005	73.10%	9	3,366,144	62.12%	9	3,674,393

Panel C: Change in audit fees (Δ*AFEE*) conditioned on compliance and information costs

	Compliant Firms	Non-compliant Firms
High Information Costs (*HIX* = 0)	0.215	0.200
Low Information Costs (*HIX* = 1)	0.189	0.254

Panel D: Main variables in levels for years 2000 and 2005

	Compliant Firms		Non-compliant Firms	
	2000	2005	2000	2005
AFEE	6.230	7.703	6.260	7.644
SIZE	7.488	8.050	7.549	7.896
LEV	0.200	0.163	0.205	0.157
ROA	0.024	0.058	0.025	0.060
LIQD	2.658	2.297	2.687	2.405
SEG	1.822	1.766	1.809	1.818
LOSS	0.205	0.093	0.216	0.076

Panel A of this table reports the means and standard deviations of the main variables used

in Equation (2) between compliant and non-compliant firms. The matched sample consists of 602 observations. *T*-test (*p*-values) test for differences in means between compliant and non-compliant firms. Panel B reports the means of board independence and audit fees over time from 2000 to 2005. Panel C reports the 2 × 2 matrix of audit fee changes conditioned on non-compliance indicator (*NC*) and information costs (*HIX*). Panel D reports mean values of the main variables in levels for years 2000 and 2005 for compliant and non-compliant firms separately. Variables are defined in the Appendix.

Table 2. Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ*AFEE*	1	**-0.031**	0.286	0.035	-0.105	**-0.230**	-0.016	**0.130**
NC	-0.028	1	-0.048	0.026	-0.017	-0.037	-0.007	-0.072
Δ*SIZE*	**0.290**	-0.049	1	**-0.289**	**-0.084**	-0.035	0.067	0.035
Δ*LEV*	0.036	0.013	0.018	1	**-0.217**	-0.007	0.041	0.111
Δ*ROA*	**-0.134**	0.005	-0.074	**-0.216**	1	**0.081**	0.015	**-0.312**
Δ*LIQD*	**-0.130**	-0.040	-0.006	0.001	**0.154**	1	0.017	**-0.144**
Δ*SEG*	-0.001	0.006	**0.086**	0.041	-0.003	0.035	1	-0.028
Δ*LOSS*	**0.112**	-0.071	0.050	**0.137**	**-0.602**	**-0.138**	0.015	1

Pearson (Spearman) correlations for the main variables of Equation (2) are reported above (below) the diagonal. Correlations significant at the 5 per cent level in a two-tailed test are in boldface. The sample has 602 observations. Variables are defined in the Appendix.

Table 3. Relation between Board Independence and Change in Audit Fees

	Dep. Var. = Δ*AFEE*	
	(1)	(2)
Intercept	0.242***	0.243***
	(12.74)	(12.89)
NC	-0.005	-0.008
	(-0.61)	(-0.94)
NC×*HIX*		0.045***
		(2.48)
Δ*SIZE*	0.395***	0.389***
	(7.38)	(7.29)
Δ*LEV*	0.052***	0.053***
	(2.55)	(2.64)
Δ*ROA*	-0.007	-0.006
	(-0.38)	(-0.36)
Δ*LIQD*	-0.009***	-0.009***
	(-5.78)	(-5.84)
Δ*SEG*	-0.007	-0.005
	(-0.46)	(-0.33)
Δ*LOSS*	0.018*	0.017*
	(1.86)	(1.78)
Industry-fixed effects	Yes	Yes
n	602	602
Adj. R^2	0.19	0.20

This table reports the regression results of the relation between board independence and change in audit fees. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, under two-tailed tests. t-statistics are in parentheses. Variables are defined in the Appendix.

Table 4. Relation between Audit Committee Independence and Change in Audit Fees

	Dep. Var. = Δ*AFEE*	
	(1)	(2)
Intercept	0.239***	0.241***
	(12.60)	(12.79)
NCA	0.001	-0.004
	(0.17)	(-0.52)
NCA×HIX		0.043**
		(2.43)
Δ*SIZE*	0.396***	0.391***
	(7.41)	(7.33)
Δ*LEV*	0.051***	0.053***
	(2.54)	(2.64)
Δ*ROA*	-0.006	-0.006
	(-0.35)	(-0.34)
Δ*LIQD*	-0.009***	-0.009***
	(-5.75)	(-5.79)
Δ*SEG*	-0.007	-0.005
	(-0.46)	(-0.32)
Δ*LOSS*	0.018**	0.018*
	(1.93)	(1.84)
Industry-fixed effects	Yes	Yes
n	602	602
Adj. R^2	0.19	0.20

This table reports the regression results of the relation between audit committee independence and change in audit fees. *,**,*** indicates statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, under two-tailed tests. t-statistics are in parentheses. Variables are defined in the Appendix.

Table 5. Relation between Board Independence and Change in Audit Fees: Accelerated Filers

	Dep. Var. = Δ*AFEE*	
	(1)	(2)
Intercept	0.263***	0.266***
	(11.84)	(12.05)
NC	-0.008	-0.012
	(-0.85)	(-1.28)
NC×*HIX*		0.052***
		(2.65)
Δ*SIZE*	0.318***	0.309***
	(4.60)	(4.48)
Δ*LEV*	0.066***	0.068***
	(2.83)	(2.93)
Δ*ROA*	0.012	0.012
	(0.65)	(0.67)
Δ*LIQD*	-0.009***	-0.009***
	(-4.95)	(-5.08)
Δ*SEG*	-0.023	-0.020
	(-1.27)	(-1.20)
Δ*LOSS*	0.018	0.017
	(1.55)	(1.45)
Industry-fixed effects	Yes	Yes
n	396	396
Adj. R^2	0.17	0.19

This table reports the regression results of the relation between board independence and change in audit fees for accelerated filers. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, under two-tailed tests. t-statistics are in parentheses. Variables are defined in the Appendix.

Table 6. Relation between Board Independence and Change in Audit Fees: Non-compliance in 2005

	Dep. Var. = Δ*AFEE*	
	(1)	(2)
Intercept	0.245***	0.247***
	(13.00)	(13.17)
NC05	-0.014*	-0.018**
	(-1.76)	(-2.22)
NC05×HIX		0.048***
		(2.72)
Δ*SIZE*	0.390***	0.382***
	(7.28)	(7.17)
Δ*LEV*	0.051***	0.052***
	(2.52)	(2.61)
Δ*ROA*	-0.007	-0.006
	(-0.40)	(-0.36)
Δ*LIQD*	-0.009***	-0.009***
	(-5.75)	(-5.80)
Δ*SEG*	-0.007	-0.005
	(-0.47)	(-0.33)
Δ*LOSS*	0.017*	0.016*
	(1.81)	(1.72)
Industry-fixed effects	Yes	Yes
n	602	602
Adj. R^2	0.19	0.20

This table reports the regression results of the relation between board independence and change in audit fees for firms that are still non-compliant in 2005. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, under two-tailed tests. t-statistics are in parentheses. Variables are defined in the Appendix.

Table 7. Two-Stage Regressions of Audit Fees on Board Independence and Interaction with Information Cost

	First Stage Dep. Var. = Δ*Indep.Directors*	Second Stage Dep. Var. = Δ*AFEE*
	(1)	(2)
Intercept	-0.029	0.897***
	(-0.77)	(16.69)
NC	0.170***	
	(14.67)	
Δ*Indep.Directors (predicted)*		-0.086
		(-0.74)
Δ*Indep.Directors (predicted)*×*HIX*		0.410***
		(2.52)
SIZE	0.009**	-0.027***
	(2.40)	(-4.09)
LEV	-0.027	-0.068
	(-0.80)	(-1.28)
ROA	-0.097	0.089
	(-1.58)	(0.94)
LIQD	-0.004**	0.005*
	(-2.34)	(1.84)
SEG	0.005	0.003
	(0.81)	(0.31)
LOSS	-0.032**	-0.057**
	(-1.94)	(-2.17)
Industry-fixed effects	Yes	Yes
n	713	666
Adj. R^2	0.25	0.08

This table reports two-stage regression results of the relation between change in board independence and change in audit fees. The first stage uses the non-compliance indicator (*NC*) to predict the values of independent directors on the board. The second stage uses the predicted values of independent directors to estimate the relation between board independence and audit fees, conditional on information environment. *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively, under two-tailed tests. t-statistics are in parentheses. Δ*Indep.Directors* is the percentage change in independent directors from 2000 to 2005. Other variables are defined in the Appendix.